Antecedents of industrial brand equity: an empirical study

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Abstract

Industrial branding has emerged as an important issue, allowing firms to gain substantial competitive advantage, especially in markets where product commoditization and electronic procurement are on the increase. This article proposes, and empirically validates, a theoretically structured approach to measure brand equity, its antecedents and its consequences for industrial products. The model distinguishes between product and corporate brand equity, uses buyer perceived performance on the dimensions of the marketing mix as antecedents of brand equity, and relates them to re-purchase and loyalty intentions.

Keywords: Industrial brand equity, Marketing mix, Industrial relations

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1. Introduction

Branding and brand management can no longer be considered the exclusive domain of consumer marketing. A recent overview of the world's 100 strongest brands not only lists Coca Cola, McDonald's and Disney, but also includes many renowned industrial brands such as Boeing, SAP, Xerox, Siemens, and GE (Interbrand, 2003). One of the reasons for the increasingly important role of industrial branding is the commoditization of many industrial products. Another reason is the growing importance of B2B buying and selling via the Internet. There is evidence that online buyers will use cues like the brand to reduce the risks involved in purchasing decisions (Hunter et al., 2004; Ulaga & Chacour, 2001). Analogous to consumer marketing, effective branding strategies for commodity-like products might therefore yield substantial benefits (Bendixen et al., 2004). For example, Dupont, an industrial company that brands almost all the products and ingredients it manufactures, has had considerable success with brands such as Teflon, Kevlar, and Lycra. Strong brands could therefore be considered a key source of sustainable competitive advantage in B2B environments (Gordon et al., 1993; Kumar et al., 2003).

Despite these developments, and the total value of transactions in the B2B market, little empirical research has been conducted in the domain of industrial branding (Gordon et al., 1993; Low & Blois, 2002; Mudambi, 2002; Mudambi et al., 1997; Shipley & Howard, 1993). Driven by the recognition of a need for empirical validation, the present study will be guided by the following research question:

What is the role of brand equity in industrial purchasing?

The following interrelated sub questions have been formulated:

1) How can B2B brand equity be conceptualized and measured?

2) What are antecedents of B2B brand equity?

3) What are consequences of B2B brand equity?

The present article is structured as follows. First, in a review of current research indicators, antecedents and consequences of industrial brand equity are identified, and a number of hypotheses are derived with respect to their relationships. These are summarized in a theoretical model. Furthermore, a research design is presented and the structural model is validated by means of an empirical study. A presentation and discussion of the results follows. Next, the managerial implications of the findings are discussed. Finally, limitations of the research and suggestions for future research are presented.

2. Literature Review and Development of Propositions

2.1. Customer Based Industrial Brand Equity

So far, little explicit agreement exists as to the conceptualization of industrial brand equity. In consumer marketing literature, brand equity is generally defined as the added value endowed to a product as a result of past investments in the marketing of the brand (Keller, 1998). Added value of a brand is created in the mind of consumers, as a result of perceived performance on various marketing dimensions. Consequently, it has been argued that industrial brand equity could be conceptualized and measured from the perspective of the industrial buyer (Mudambi et al., 1997). Buyer-based brand equity seems a good starting point to assess industrial brand equity (Lassar et al., 1995; Wood, 2000). Therefore, a customer-based method developed in consumer research will be adapted to the specific situation of the industrial buyer.

Differences exist between end consumers and industrial buyers, in terms of the process leading to buying decisions. On the one hand, industrial buyers are thought to be more rationally concerned with determinants like product performance, product

quality, delivery, service and price, than end consumers (Shipley & Howard, 1993). On the other hand, conditions are said to exist under which industrial buyers appear to make a purchase decision on the basis of the brand name instead of price, or other factors. This may occur when failure of the purchased product would have dire consequences for the buyer's organization, or for the buyer personally; when the product requires substantial service or support; when the product is complex; or when the buyer is under time and/or resource constraints (Hutton, 1997). Although procurement in industrial markets is often rational and calculative, brands could play a significant role in this process under conditions of risk. Also, more and more industrial products are purchased online through specifically designed websites (Sharma et al., 2001). In such situations, brands could be important in establishing a consideration set of potential suppliers in the mind of the buyer.

Customer based brand equity is said to exist in several interrelated dimensions: brand awareness, brand quality, brand associations and brand loyalty (Aaker, 1991; Aaker, 1996; Keller, 1993; Keller, 1998). While several of these dimensions appear directly transferable to industrial branding, others appear irrelevant. Brand awareness, i.e. the ability to recognize, or recall, that a brand is a member of a certain product category (Aaker, 1991) appears very important in industrial branding. This is because often large numbers of alternative suppliers and products must be considered and compared (Michell et al., 2001). Brand awareness thus reflects the ability to identify the brand under conditions of complexity and time pressure (Keller, 1998). Furthermore, perceived brand quality, i.e., a perception of the overall quality or superiority of a brand relative to alternative products (Low & Lamb Jr., 2000), also seems an important indicator of industrial brand equity. Brand associations, reflecting non-product related associations evoked by the brand, play an important role in consumer branding and the

facilitation of brand extensions. Industrial brands, however, are rarely if ever used to evoke non-product related associations. Therefore brand associations are not considered in this study.

Brand loyalty, although often viewed as a source, dimension or indicator of brand equity (Aaker, 1991; Keller, 1993; Keller, 1998), will be conceptualized as a desired outcome of brand equity. Brand loyalty refers to the tendency to be loyal to a brand, demonstrated by the intention to buy the brand as primary choice (Yoo & Donthu, 2001). Brand loyalty can be defined in either behavioral or attitudinal terms. Behavioral - or purchase loyalty consists of repeated purchases of the brand. Attitudinal loyalty refers to the degree of dispositional commitment in terms of some unique value associated with the brand (Chaudhuri & Holbrook, 2001). Effects on loyalty and purchasing intentions of two related, though separable categories of brand equity can generally be investigated in an industrial context. Industrial products are often individually branded, i.e. the product brand is distinct from the corporate brand. This leads to the following hypothesis:

H1: A direct positive relationship exists between product brand equity and repeat purchasing and loyalty intentions.

On the other hand, the company manufacturing the product will have built a corporate reputation and associated corporate brand equity. This is partially driven by factors independent of specific individual products (e.g. stock performance, corporate governance, and corporate promotional efforts), and partially driven by individual product brand equity. Corporate brand equity will directly influence repeat purchase intentions as a purchasing risk reducer. At the same time, product brand equity will also affect repeat purchasing intentions indirectly, through its effect on corporate brand equity. This leads to the following hypotheses:

H2: A direct positive relationship exists between corporate brand equity and repeat purchasing and loyalty intentions.

H3: A positive relationship exists between product brand equity and corporate brand equity.

2.2. Antecedents of Brand Equity

In consumer research, brand equity has been related to expenditures in the dimensions of the marketing mix (Yoo et al., 2000). In the present study the relevance of several marketing mix dimensions for the creation of industrial brand equity will be investigated. Antecedents of the two distinct components of industrial brand equity (product and corporate) need to be identified. In previous studies, quality (Bendixen et al., 2004), or more specifically performance components (Mudambi et al., 1997), have been identified as the main drivers of industrial brand equity. That is, assessments of the product, the supplier of the product, and any other variables involved in the purchase and use of the product (Gordon et al., 1993). Drivers identified in previous studies were: physical product attributes, distribution services (ordering and delivery), and support services. Because the performance and perceived quality of products (Abratt, 1986; Michell et al., 2001) are crucial in an industrial context, overall satisfaction with the product will be the main driver of product brand equity:

H4: A direct positive effect of overall satisfaction with the product exists on product brand equity.

In an industrial context, price is often viewed as the most important purchasing decision criterion, while others estimate that price accounts for not more than 70% of the final decision (Mudambi et al., 1997). However, quality can be considered equally important as price (Alvarez & Galera, 2001). Perceived value is therefore a significant

concept in industrial markets. It is important that the perceived value by the buyer exceeds the price. Therefore:

H5: A higher perceived value for money is associated with higher levels of satisfaction with the product.

Distribution performance plays an important role in creating satisfaction with a product in industrial markets (Mudambi et al., 1997). Distribution entails all aspects of ordering, availability and delivery. Distributors and end-users evaluate industrial suppliers on their distribution performance. It may therefore be expected that:

H6: The perceived quality of the distribution of a product is positively associated with overall satisfaction with the product.

Buyers indicate that service is important to them, even to the point where they are willing to pay more for what they perceive to be superior service (Duckler, 2001). Service quality, together with the product's physical quality, increasingly form the basis for competitive advantage (Alvarez & Galera, 2001). Other research has also confirmed the importance of quality support services (e.g. Mudambi et al., 1997). We therefore expect:

H7: Service quality is positively associated with the corporate brand.

To make good purchase decisions, industrial buyers need information. In the past, industrial markets were characterized by asymmetric information: Sellers had more information than buyers. With the increased use of the Internet this situation is changing. Buyers are able to get more and more information, not only through brochures or salespeople, but also by means of online information (Sharma et al., 2001). Therefore:

H8: Providing better information is associated with a higher level of satisfaction with service.

For many industrial products, the need to have face-to-face interaction between buyer and seller is fundamental to the buyers' satisfaction. Where products are complex, or high in value, buyers expect value-added relationships. Purchase decisions depend not only on the evaluation of the functional benefits of the product itself, but also on the assessment of the people in the company behind it, their skills, attitudes, behaviors, mode of communication, etc. (Gordon et al., 1993). All contacts with the supplier will indirectly contribute to the buyer's knowledge and perception of the corporate brand (Davis, 2000). It is likely that buyers associate employees with superior skills with a higher level of service quality. As a result we expect:

H9: Better skilled employees are associated with a higher level of satisfaction with service.

The propositions were summarized in a conceptual model, visualized in Fig. 1.

Please Insert Fig. 1 Here

3. Research Design

The model was validated with data collected from industrial customers of a multinational specialty chemical company, owning over 1000 product brands. An industrial brand in the category "high performance engineering plastics", used primarily in the electrical/electronic- and automotive industry was investigated. To increase the external validity of our study, in-depth interviews were conducted with eleven purchasing engineers in the UK, Germany, France, Belgium, and the Netherlands. These interviews confirmed that, in varying degrees, Product, Price, Promotion, Place, and People contribute to the creation of industrial brand equity.

3.1. Questionnaire Development

Based on previous research and the interviews, a questionnaire was developed. Items were measured as self-reported assessments of statements, evaluated on a 7-point Likert scale. The questionnaire was made available online.

3.2. Sampling

With the support of company sales representatives, an invitation to participate in the survey was sent to buyers in Europe, the US, and Asia. The response rate was 8.8%, with 36 respondents from Europe, 18 from the US, and 13 from Asia, and 8 from elsewhere (n=75). 37 were active in the electrical/electronics industry, 26 in the automotive industry, and 12 were active in various other industries. 60% of the respondents were engineers.

3.3. Analysis and Results

The data were screened for multivariate outliers by calculating the Mahalanobis D^2, comparing the position of each value with the center of all observations. No outliers were identified. Distributions of all variables were tested for normality. No aberrations were detected. Several factor analyses were performed to reduce the number of variables. Based on the results of factor analyses, the multi-item scales were summated. Item loadings, means and standard deviations are presented in Table 1.

Please Insert Table 1 Here

Correlations were calculated between the factors. Correlations and descriptive statistics for the resulting factors are presented in Table 2.

Please Insert Table 2 Here

Regression analyses were then performed on the data. Equations are represented by:

(1) $PROD = \alpha_0 + \beta_1 VAL + \beta_2 DIS + \varepsilon_1$

(2) $SERV = \alpha_1 + \beta_3 INFO + \beta_4 PERS + \varepsilon_2$

(3) $PBE = \alpha_2 + \beta_5 PROD + \varepsilon_3$

(4) $CBE = \alpha_3 + \beta_6 SERV + \beta_7 PBE + \varepsilon_4$

(5) $LOY = \alpha_4 + \beta_8 PBE + \beta_9 CBE + \varepsilon_5$

In each equation, α represents the intercept and ε the error term. Partial Least Squares (PLS) regression was used to simultaneously estimate all relationships put forward in the conceptual model. The reasons to opt for PLS are threefold. First, PLS allows estimation of structural models for relatively small sample sizes (Chin & Newsted, 1999). Second, given the exploratory nature of the research and an emphasis on theory development, PLS is particularly useful given its prediction-oriented nature (Barclay et al., 1995; Fornell & Cha, 1994). Third, by opting for PLS potential problems due to multicollinearity were avoided (Ryan et al., 1999). Given the significant correlations among predictor variables in our model the possible distorting consequences of multicollinearity cannot be ignored. Results are presented in Table 3.

Please Insert Table 3 Here

From Table 3 it can be concluded that all hypotheses are supported by the data. This implies that the model is validated by the sample.

4. Conclusion

Brand equity appears to play a significant role in industrial branding. It was conceptualized as the result of past investments in the 5 P's of the marketing mix. That is, investments in product, place, people, promotion and price. In the business-to-business context, promotion was interpreted as providing information. Buyers' perceptions about the 5P's have an influence on the way they perceive and evaluate the brand. This, in turn, has an effect on their purchase decisions. By investing in the 5P's,

companies create brand awareness and a positive brand image. In this way, brand equity and loyalty are created. Two interrelated components of brand equity were distinguished: product brand equity and corporate brand equity.

The results show that product brand equity is mostly influenced by physical product attributes and distribution. Employees and information played a lesser role. Corporate brand equity is mostly determined by service attributes, and employees. Here distribution and value did not play a direct role. In terms of direct effects, the corporate brand seems to be slightly more important in industrial markets than the individual product brand; however, the product brand contributes not only directly to behavioral intentions, but also indirectly via corporate brand equity.

4.1. Managerial Implications

For managers it is important to realize that the proposed antecedents of the two components of industrial brand equity (Product Brand Equity and Corporate Brand Equity) correspond with the P's of the marketing mix: product, place, promotion, price and people. The 5P's are usually fully controlled by the company in order to facilitate exchange. The study therefore confirmed that brand equity can be explained as a result of past investments in the marketing of the brand (Keller, 1998).

It is also evident from the study that industrial companies can benefit from investing in their brands and from the resulting brand equity. Tentatively, the following recommendations can be made for industrial companies who wish to build and benefit from brand equity:

In order to build a strong industrial product brand, companies should 1) focus their efforts on buyers' perceptions of the product. Buyers should perceive the product as high quality, dependable, consistent and innovative; 2) create favorable perceptions

with respect to the development lead-time of the product; 3) offer value for money; 4) invest in reliable distribution. These associations help to create a strong product image.

Besides a favorable perception of the product, a favorable impression of the employees will aid the company in creating a strong corporate brand. Apparently buyers associate the service they receive with the company.

A major finding in this study is the importance of corporate brand names. Loyalty to a product is partially driven by a strong corporate brand.

Industrial branding, in terms of image creation, competitive differentiation, and buyer recognition, could be no less beneficial, and no more difficult to achieve for industrial companies than for B2C companies (Shipley & Howard, 1993).

4.2. Limitations and Suggestions for Further Research

A number of limitations pertain to this study. First, it focused exclusively on a single industrial market: specialty chemicals. Furthermore, the relatively small sample prohibits the full generalizability of the conclusions. The findings can be generalized cautiously to markets similar to the one studied. Research is needed on the determinants of industrial brand equity for a broad range of industrial markets. Another issue is that the sample of respondents consisted mainly of engineers. Previous research demonstrated that a variety of managers is involved in the purchasing process. In some cases companies may have established a formal buying center, in other cases the members may be part of an informal group. The number of people involved in the purchasing process and their positions may vary across organizations. In future research, besides engineers also other participants in the buying decision should be involved.

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Table 1
Composition of measures, and item descriptive statistics

Factor (Reliability (α); EigenValue; Variance explained) Item	Std. Loading	Mean	Std Dev.
Product Quality (α = .83; EV = 4.11; VAR = 58.75%)			
Product X is a high quality product	.80	5.60	1.23
Product X development lead time is excellent	.75	4.77	1.24
Product X is a dependable and consistent product	.85	5.26	1.34
Product X is an innovative product	.90	4.92	1.39
Service Quality (α = .80; EV = 1.59; VAR = 22.70%)			
The technical support of Product X is excellent	.93	5.15	1.84
We are satisfied with production support for Product X	.96	5.16	1.60
We are satisfied with development support for Product X	.90	5.13	1.69
Product Distribution (α = .89; EV =3.07; VAR = 43.85%)			
Ordering product X is convenient	.86	5.59	1.31
Product X is available when we need it	.92	4.93	1.42
Product X is available where we need it	.91	5.11	1.47
Product X is supplied in a reliable way	.78	5.18	1.61
Product Value (α = .80; EV = 2.13; VAR = 30.49%)			
Product X reduces production costs	.83	4.10	1.51
Product X offers value for money	.78	4.48	1.31
Product X reduces systems costs	.88	3.83	1.56
Service Personnel (α = .86; 1.46; VAR = 16.18%)			
Company Y has highly skilled employees	.67	5.61	1.28
Company Y staff is well dressed and appear neat	.69	5.70	1.37
I can trust Company Y staff	.90	5.66	1.28
Company Y staff is always willing to help buyers	.91	5.92	1.18
Information Services (α = .92; EV = 5.90; VAR = 65.58%)			
Service staff understands our needs	.78	5.10	1.65
We are satisfied with the Information about Product X	.91	4.97	1.67
On-line information about Product X is of good quality	.91	4.41	1.77
The documentation of Product X is of good quality	.90	4.83	1.78
If I request supplementary info about Product X, I receive it quickly	.89	5.19	1.71
Product Brand Equity (α = .77; EV = 1.33; VAR = 16.59%)			
Product X generally has a good reputation	.89	5.22	1.19
Rate Product X's reputation on a scale (1 to 7)	.93	5.17	1.12
Product X is a well-known name in the market	.58	4.93	1.66
Corporate Brand Equity (α = .85; EV = 4.22; VAR = 52.76%)			
Company Y is a financially stable company	.86	5.44	1.18
Company Y is a leading edge supplier	.72	4.97	1.27
Company Y is a well known name around the world	.78	5.18	1.34
The fact that Company Y produced Product X certainly adds value	.85	5.05	1.23
The fact that Company Y produces Product X is important to me	.72	5.09	1.34
Loyalty (α = .89; EV = 3.90; VAR = 64.92 %)			
Overall we are very satisfied with Product X	.72	5.03	1.40
Overall we are very satisfied with Company Y	.84	5.31	1.27
If asked, we would recommend Product X	.81	5.12	1.35
If asked, we would recommend Company Y	.84	5.36	1.36
We intend to use Product X again in the future	.81	5.59	1.30
We intend to do business again with Company Y in the future	.81	5.66	1.37

Table 2
Descriptive statistics: Means, standard deviations and Pearson correlations among constructs

Construct	Mean	Std. dev.	Value	Distribution	Product	Information	Personnel	Service	Product BE	Corporate BE
Value	4.14	1.12								
Distribution	5.20	1.10	-.007							
Product	5.14	1.00	.332*	.273*						
Information	4.85	1.44	.077	.582*	.290*					
Personnel	5.60	1.05	.122	.622*	.519*	.689*				
Service	4.79	1.29	.016	.548*	.315*	.825*	.689*			
Product BE	5.01	.86	.244*	.212	.563*	.266*	.361*	.214		
Corporate BE	5.15	.97	.155	.236*	.644*	.317*	.488*	.334*	.621*	
Loyalty Intentions	5.34	1.06	.284*	.462*	.804*	.362*	.704*	.403*	.567*	.671*

*p-value <.05

Table 3

PLS estimates conceptual model

Eq.	Model fit	Relationship	Coefficient	T-Value	p-Value	Conclusion
(1)	$R^2 = 0.36$; $F_{2, 75} = 21.09$ ($p < 0.0001$)	VAL → PROD	0.51	5.11	< 0.0001	Supports H5
		DIS → PROD	0.32	2.05	0.0438	Supports H6
(2)	$R^2 = 0.81$; $F_{2, 75} = 159.87$ ($p < 0.0001$)	INFO → SERV	0.58	5.34	< 0.0001	Supports H8
		PERS → SERV	0.38	3.24	0.0018	Supports H9
(3)	$R^2 = 0.54$; $F_{1, 75} = 89.22$ ($p < 0.0001$)	PROD → PBE	0.72	9.37	< 0.0001	Supports H4
(4)	$R^2 = 0.50$; $F_{2, 75} = 37.50$ ($p < 0.0001$)	SERV → CBE	0.18	2.07	0.04185	Supports H7
		PBE → CBE	0.64	7.49	< 0.0001	Supports H3
(5)	$R^2 = 0.56$; $F_{2, 75} = 47.73$ ($p < 0.0001$)	PBE → LOY	0.38	3.26	0.00167	Supports H1
		CBE → LOY	0.42	3.69	0.00042	Supports H2

Figure 1: A Proposed Model for Measuring Industrial Brand Equity